

usually from a menu, i.e. selecting a menu option from a plurality of menu options. Selection devices include apparatuses implemented in hardware, firmware, software, or a combination thereof." on page 44, line 15.

In the Claims, please cancel claims 2-18, 59-60, 81, 90-93, 95-100, and 109-111.

In the Claims, please add or amend as indicated:

94. (amended three times) A voice output system for a user having impaired motor control, said voice output system comprising:

- (a) a display screen;
  - (b) a delimit device [means for] completely delimiting an invisible selectable region outside the display screen associated with a sequence of one or more words;
  - (c) a voice output device;
  - (d) a movement related signal receiver [receiving means] for receiving a movement related signal indicating successive locations with respect to the display screen; and
  - (d) a selection device [means], responsive to a quantity equalling or exceeding a predetermined quantity, the quantity being a function of the durations of one or more successive periods of intersection of two or more of the successive locations and the selectable region outside the display screen, for selecting the selectable region;
- whereby the user may select the selectable region outside the display and speak, with the voice output device, the sequence of one or more words.

113. (once amended) The apparatus of claim 106 wherein each of the succession of dwell events [the dwell event] includes a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of the difference in time between the occurrence of the second successive location and the first successive location [durations of one or more successive periods of intersection of two or more of the successive locations and the intersected selectable subregion].

119. (once amended) The voice output system [apparatus] of claim 114 wherein the delimit device is further operative to delimit a second selectable region outside the working region and adjacent one of the first selectable regions, the second [first] selectable region selectable by the user and having an external boundary wherein the external boundary includes the side of the selectable region furthest from the working region, the second selectable region having a confiner for

preventing the movement related signal indicating the location from moving beyond the external boundary of the second selectable region or having an activation area extending beyond the external boundary of the second selectable region, the second selectable region associated with a second sequence of one or more characters, a second sequence of one or more words, or a second sequence of one or more symbols representing the second sequence of one or more words.

120. (once amended) The voice output system [apparatus] of claim 114 wherein a particular confiner of at least one of the selectable regions is further operative to confine the movement related signal within a particular side of the selectable region other than the external boundary.

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Concl'd 121. (once amended) The voice output system [apparatus] of claim 120 wherein the particular confiner, responsive to any one of:

- (a) a path of the movement related signal;
  - (b) a change of direction of the movement related signal;
  - (c) a velocity of the movement related signal;
  - (d) an acceleration or deceleration of the movement related signal; and
  - (e) a change in the acceleration or deceleration of the movement related signal;
- may allow the movement related signal to pass through the particular side of the selectable region [other than the external boundary].

122. (once amended) The voice output system [apparatus] of claim 114 wherein a first cursor is displayed on the display screen [area] at or near the location indicated by the movement related signal and a second cursor differing in appearance from the first cursor is displayed on the display screen [area] responsive to the location indicated by the movement related signal intersecting or nearly intersecting the external boundary of the particular of the selectable region.

126. (once amended) The voice output system of claim 114 wherein each of the selectable regions is located outside the display screen [area].

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Cont 127. (once amended) The voice output system of claim 126 further comprising indicators on the

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display screen [area], each indicator associated respectively with one of the selectable regions and indicating the location of the associated selectable region.

5 132. (once amended) The voice output system of claim 131 further comprising a pointer selected from the group consisting of a (1) mouse; (2) trackball; (3) joystick; (4) stylus and graphics tablet; (5) lightpen; (6) thumb wheel; (7) touch screen; (8) head pointer; [and] (9) intraoral pointer; and (10) eye tracker, the pointer coupled to the computer system; and wherein the movement related signal is responsive to [reflects movement of] the pointer and the pointer is responsive to the user movement.

10 133. (once amended) The voice output system of claim 114 wherein the user movement is the movement of a body member of the user including any one of:

- 65
- 15 (a) the head of the user;  
(b) an eye of the user;  
(c) a shoulder of the user;  
(d) an arm of the user;  
(e) an elbow of the user;  
(f) a wrist of the user;  
(g) a hand of the user;  
20 (h) a finger of the user;  
(i) a thumb of the user;  
(j) a knee of the user;  
(k) a leg of the user;  
(l) a foot of the user;  
25 (m) a toe of the user;  
(n) an ankle of the user; and  
(o) the trunk of the user [other than either of the user's eyes].

30 158. (once amended) An apparatus for selecting a menu option from a plurality of menu options, said apparatus comprising:

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- (a) a display area including a working region with a periphery;  
(b) a movement related signal receiver for receiving a movement related signal indicating a

location to be selected with respect to the display area responsive to a user selection by a user;

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- (c) a delimit device for delimiting selectable regions adjacent the working region, each of the selectable regions having an external boundary wherein the external boundary is the side of the selectable region furthest from the working region, each of the selectable regions having a confiner for preventing the movement related signal indicating the location from moving beyond the external boundary of the selectable region or having an activation area extending beyond the external boundary of the selectable region, each of the selectable regions associated respectively with one of the menu options; and
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- (d) a selection device [selector] for selecting the menu option associated with a particular one of the selectable regions responsive to an intersection of the movement related signal and the particular selectable region or the activation area associated therewith, thereby providing the user with the ability to select the particular selectable region while overshooting the particular selectable region with the movement related signal or by providing a confiner to the particular selectable region for the movement related signal.
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169. (once amended) The voice output system [apparatus] of claim 114 wherein the voice output device is further responsive to a path of the user movement to the first particular selectable region or the activation area associated therewith.

170. An apparatus for selecting a menu option from a plurality of menu options, said apparatus comprising:

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- (a) a display screen;
- (b) a delimit device for at least partially delimiting a plurality of selectable regions, each of the selectable regions outside the display screen and each associated respectively with a displayed menu option;
- (c) a movement related signal receiver for receiving a movement related signal indicating successive locations with respect to the display screen; and
- (d) a selection device, responsive to a first dwell event associated with a particular one of the selectable regions outside the display screen, the particular selectable region intersected by a plurality of the successive locations, for selecting the particular menu option associated with the particular selectable region.
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171. The apparatus of claim 170 further comprising a pointer, responsive to the movement of a body member of an operator, for generating the movement related signal, the body member of the operator including any one of:

- (a) the head of the operator;
- (b) an eye of the operator;
- (c) a shoulder of the operator;
- (d) an arm of the operator;
- (e) an elbow of the operator;
- (f) a wrist of the operator;
- (g) a hand of the operator;
- (h) a finger of the operator;
- (i) a thumb of the operator;
- (j) a knee of the operator;
- (k) a leg of the operator;
- (l) a foot of the operator;
- (m) a toe of the operator;
- (n) an ankle of the operator; and
- (o) the trunk of the operator.

172. The apparatus of claim 170 wherein the first dwell event includes a plurality of periods of intersection, each of two or more of the successive locations and the particular selectable region.

173. The apparatus of claim 170 wherein the particular selectable region is not completely visible.

174. The apparatus of claim 170 wherein at most one of the selectable regions is adjacent the display screen.

175. The apparatus of claim 170 wherein each of the successive locations is relative to a predetermined location on the display screen or to a previous location of the successive locations.

176. The apparatus of claim 170 wherein the first dwell event includes a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of the durations of one or more successive periods of intersection of two or more of the successive locations and the particular selectable region.

177. The apparatus of claim 170 wherein the first dwell event includes a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of a ratio between:

- (1) the durations of one or more successive periods of intersection of two or more of the successive locations and the particular selectable region; and
- (2) the durations of one or more successive periods of intersection of two or more of the successive locations and one of the selectable regions other than the particular selectable region.

178. The apparatus of claim 170 further comprising a plurality of selectable regions on the display screen, each associated respectively with one of the selectable regions outside the display screen; and wherein the selection device is further operative, responsive to a second dwell event associated with a certain one of the selectable regions on the display screen, the certain selectable region associated with the particular selectable region, to select the particular menu option.

179. The apparatus of claim 178 wherein each of one or more of the selectable regions on the display screen is adjacent the associated selectable region outside the display screen.

180. The apparatus of claim 178 wherein each of one or more of the selectable regions on the display screen indicates the location of the associated selectable region outside the display screen.

181. The apparatus of claim 178 wherein the plurality of selectable regions on the display screen together at least partially circumscribe a region on the display screen.

182. The apparatus of claim 170 further comprising an indicator for indicating the remaining dwell time required to select the intersected selectable region.

183. The apparatus of claim 170 wherein the movement related signal is responsive to the movement of a body member of an operator having impaired ability to sense the position of the body member and the apparatus further comprises a tactile indicator for indicating tactilely to the operator the position of the body member.

184. The apparatus of claim 170 further comprising an indicator for indicating on the display screen the location of one of the successive locations located outside the display screen.

185. The apparatus of claim 170 further comprising an indicator for indicating on the display screen the distance between one of the successive locations located outside the display screen and the point on the display screen closest thereto.

186. The apparatus of claim 170 further comprising an operator fatigue detector for detecting operator fatigue and wherein the first quantity is further a function of detected operator fatigue.

187. The apparatus of claim 170 wherein the first dwell event includes a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of the duration of a period of intersection of two of the successive locations and the particular selectable region; and wherein the apparatus further includes an indicator for indicating the remaining dwell time required to select the particular menu option.

188. The apparatus of claim 187 further comprising a certain selectable region on the display screen, the certain selectable region associated with the particular selectable region; and wherein the first quantity is further a function of the duration of a period of intersection of two of the successive locations and the certain selectable region.

189. The apparatus of claim 170 wherein the particular menu option is associated with a submenu comprising a plurality of submenu options each associated respectively with one of the selectable regions; and wherein the selection device is further operative:

- (a) to display on the display screen the submenu options, responsive to the first dwell event;
- and

- (b) to select, responsive to a second dwell event, the submenu option associated with the selectable region associated with the second dwell event.

190. The apparatus of claim 170 wherein the particular selectable region is invisible.

191. The apparatus of claim 170 wherein the particular menu option is associated with a submenu comprising a plurality of submenu options each associated respectively with one of the selectable regions; and wherein the selection device is further operative to select, responsive to a second dwell event, the submenu option associated with the selectable region associated with the second dwell event.

192. The apparatus of claim 170 wherein the particular menu option represents a sequence of one or more words; and further comprising a voice output device for speaking the sequence of one or more words responsive to the selection device selecting the particular menu option.

193. The apparatus of claim 192 wherein the particular selectable region is invisible.

194. The apparatus of claim 192 wherein the selection device is responsive only to the first dwell event.

195. The apparatus of claim 170 further comprising a certain selectable region on the display screen, the certain selectable region associated with the particular selectable region; and wherein the first dwell event includes a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of:

- (a) the durations of one or more successive periods of intersection of two or more of the successive locations and the certain selectable region; and
- (b) the durations of one or more successive periods of intersection of two or more of the successive locations and the particular selectable region.

196. The apparatus of claim 170 further comprising a signal generating device, coupled to a device, for generating a device control signal corresponding to a device control function for controlling the device; wherein the particular menu option represents the device control function; and



wherein the signal generating device, in response to the first dwell event, generates the device control signal.

197. The apparatus of claim 196 wherein the device includes any one of:

- (a) a computer peripheral;
- (b) a device capable of playing previously recorded sound;
- (c) a device capable of playing previously recorded video;
- (d) a household appliance;
- (e) a lamp;
- (f) a microprocessor;
- (g) a motorized transport device including either one of a scooter and a wheelchair;
- (h) a radio;
- (i) a robot;
- (j) a security system;
- (k) a television;
- (l) a thermostat;
- (m) a voice output device;
- (n) a workstation;
- (o) an alarm; and
- (p) an office appliance.

198. An apparatus for speaking a sequence of one or more words, said apparatus comprising:

- (a) a voice output device;
- (b) a plurality of sequences of one or more words, or a plurality of sequences of one or more symbols each sequence of one or more symbols representing one of the sequences of one or more words;
- (c) a display screen including a working region with a periphery, the display screen capable of displaying a plurality of selectable regions adjacent the periphery of the working region, each of the selectable regions selectable by the user, each of the selectable regions associated respectively with and simultaneously displaying on the display screen one of the sequences of one or more words or symbols; and
- (d) control means for:

- (1) receiving a movement related signal indicating a location with respect to the display screen responsive to user movement by a user, the user movement indicating a potential user selection;
- (2) in response to an intersection of the location and a particular one of the selectable regions, speaking, by means of the voice output device, the sequence of one or more words associated with the particular selectable region.

199. The voice output system of claim 114 further comprising:

- (a) a computer system including the display screen and the movement related signal receiver; and
- (b) a program, executable on the computer system;
- and wherein each of the delimit device and the selection device is formed by the combination of the program and the computer system.

200. The voice output system of claim 114 wherein the voice output device is further responsive to a first quantity equalling or exceeding a predetermined quantity, the first quantity being a function of a ratio between:

- (1) the durations of one or more successive periods of intersection of the movement related signal and the first particular selectable region or the activation area associated therewith; and
- (2) the durations of one or more successive periods of intersection of the movement related signal and one of the selectable regions or the activation area associated therewith other than the particular selectable region.

201. The voice output system of claim 114 wherein the location indicated by the movement related signal is outside the display screen; and further comprising an indicator for indicating on the display screen the distance between the location indicated by the movement related signal outside the display screen and the point on the display screen closest thereto.

202. The voice output system of claim 115 further comprising a user fatigue detector for detecting fatigue of the user; and wherein the predetermined period is a function of detected user fatigue.